FORM PTO-1390 (Modified) (REV 10-95) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)
1623	09/831987

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE 99/03793	NOVEMBER 26, 1999	DECEMBER 10, 1998

TITLE OF INVENTION

ELECTRONIC ARRANGEMENT FOR AN ELECTRIC COMPONENT AND AS A SUPPORT FOR SENSORS

APPLICANT(S) FOR DO/EO/US

Robert BISCHOFF

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
    A **SECOND** or **SUBSEQUENT** preliminary amendment.
16. ☐ A substitute specification.
17. ☐ A change of power of attorney and/or address letter.
18. ☒ Certificate of Mailing by Express Mail
19. ☐ Other items or information:

EL 364015981 US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/831987	PCT/DE 99/03793	1623

20. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Search Report has been prepared by the EPO or JPO	**$930.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482)	**$720.00**
☐	No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))	**$790.00**
☒	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO	**$1,070.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)	**$98.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =	**$1,000.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$0.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	9 - 20 =	0	x $18.00	**$0.00**	
Independent claims	1 - 3 =	0	x $80.00	**$0.00**	
Multiple Dependent Claims (**check if applicable**).			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$1,000.00**	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (**check if applicable**).			☒	**$500.00**	
SUBTOTAL =				**$500.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +				**$0.00**	
TOTAL NATIONAL FEE =				**$500.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (**check if applicable**).			☐	**$0.00**	
TOTAL FEES ENCLOSED =				**$500.00**	
				Amount to be: refunded	$
				charged	$

☐ A check in the amount of to cover the above fees is enclosed.

☒ Please charge my Deposit Account No. **19-4675** in the amount of **$500.00** to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **19-4675** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

MICHAEL J. STRIKER
NAME

27233
REGISTRATION NUMBER

MAY 15, 2001
DATE

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1623

Applicant(s) : BISCHOFF, R.

Serial No. :

Filed : Simultaneously

For : ELECTRONIC ARRANGEMENT FOR ELECTRIC COMPONENT AND AS A SUPPORT FOR SENSORS

SIMULTANEOUS AMENDMENT

May 15, 2001

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R S:

Simultaneously with filing of the above identified application please amend the same as follows:

In the Claims:

Cancel all claims without prejudice.

Substitute the claims attached hereto.

REMARKS:

This Amendment is submitted simultaneously with filing of the above identified application.

With the present Amendment applicant has amended the claims so as to eliminate their multiple dependency.

Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

Michael J. Striker
Attorney for Applicant(s)
Reg. No. 27233

Patent Claims

1. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element, so characterized that on a dielectric substrate (1) between two electrodes (2) a number of conductive islands (3), which are not or are not essentially connected with one another, are applied as a two-dimensional area arrangement.

2. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the structure of the conductive islands (3) consists of a fine distribution of conductive substances on any insulating substrate (1).

3. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface

structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1 [and 2], so characterized that the substance of the conductive islands (3) is firmly set on the substrate (1) and in particular it is sputtered on, steamed on, squirted on, dabbed on, imprinted or sprayed on.

4. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1 [to 3], so characterized that the conductive islands (3) are arranged within special geometric figures.

5. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1 [to 4], so characterized that the surface of the carrier for a sensor is coated with a material-selective substance.

6. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1[to 5], so characterized that a carrier for the sensor with a sufficiently thin substrate (1) has a sensor-active layer on all sides.

7. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1[to 6], so characterized that the conductive islands (3) in their short-range order show hyperstructures with anisometries of the substances with respect to the substrate.

8. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or

of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1[to 7], so characterized that isotropic structures of conductive islands (3) with ring-shaped electrodes (2)are arranged on the substrate (1).

9. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim[s] 1 [to 8], so characterized that the electrode arrangement is designed as a large area as a function element in particular as panel heating elements or photo cells.

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Patent Claims

1. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element, so characterized that on a dielectric substrate (1) between two electrodes (2) a number of conductive islands (3), which are not or are not essentially connected with one another, are applied as a two-dimensional area arrangement.

2. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the structure of the conductive islands (3) consists of a fine distribution of conductive substances on any insulating substrate (1).

3. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface

structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the substance of the conductive islands (3) is firmly set on the substrate (1) and in particular it is sputtered on, steamed on, squirted on, dabbed on, imprinted or sprayed on.

4. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the conductive islands (3) are arranged within special geometric figures.

5. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the surface of the carrier for a sensor is coated with a material-selective substance.

6. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that a carrier for the sensor with a sufficiently thin substrate (1) has a sensor-active layer on all sides.

7. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the conductive islands (3) in their short-range order show hyperstructures with anisometries of the substances with respect to the substrate.

8. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or

of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that isotropic structures of conductive islands (3) with ring-shaped electrodes (2) are arranged on the substrate (1).

9. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the electrode arrangement is designed as a large area as a function element in particular as panel heating elements or photo cells.

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Electrode arrangement for an electrical component and carrier for sensors.

The invention describes an electrode arrangement for an electrical component and a carrier for sensors, which is applied on a carrier as a surface structure with suitable dimensions of two electrically conducting electrodes, which are not connected electrically with one another.

From the general state of technology, electrode arrangements are known for measuring probes of measuring devices for the examination of substances located between the electrodes, where the electrical characteristic values and their changes are evaluated. Examples of this are resistance measuring probes and measuring probes for electrolysis or electrophoresis.

It is also known that one can systematically use certain electrical characteristics with certain substances between the electrodes and an electrode structure with proper dimensions, whereby the complex resistance of such a surface structure acts as a transformer for voltage and current. Particular examples of this according to IPC H01C 17/242 are the resistances and capacitors for thick and thin layer technology, whose adjustment to the final value is often achieved through the fine adjustment of the surface structure. This is done, for example, using systematic incisions with a laser. For this, the electrode material and the substance between them are suitably selected. In particular, air can be selected as a dielectric.

Using the special effects of substances and/or electrodes, electrical measuring devices can be produced using suitable surface structures for the examination of the measurement variables produced by the specific effect. Examples are, strain gauges, temperature sensitive elements, magnetic

field measuring probes and luminous intensity measuring probes. Further examples, for the use of special effects based on particular adjustment of surface structures are function elements such as heating elements, which produce heat from the incoming supply of electrical energy or photocells, which recover electrical energy when illuminated.

For the formation of such surface structures, substances are employed, which are enriched with conductive filling materials. The filling materials are as a rule metal powder or soot and increase, essentially dependent on their volume share in the matrix, the total conductivity of the substance. This represents a microscopically three-dimensional heterogeneous system. This has the disadvantage that conductive three-dimensional conglomerates can be formed, which can easily lead to unforeseeable stochastically occurring one-dimensional current paths due to diffusion processes and a further disadvantage that these filling materials can also appear on the surface. Adhering agents can then come into direct contact with the filling materials and trigger undesired effects.

Through the proper design of the surface structure on the carrier, which structure is determined by the electrode form, the usable specific characteristic area of the electrodes and/or the substance can be represented with a suitable valuable of the measuring probe or of the function element. This applies particularly to the representation of the conductivity of the electrodes and/or of the substance in the conductance of the measuring probe of the function element. For higher conductivity, one attempts to produce current paths, which are as long and thin as possible, and for lower conductivity short and thick paths, whereby the electrodes with a large electrode edge surface with a lower electrode surface are formed to reinforce this effect. When producing the actual dimensions of suitable structures, one

must continue to consider their influence on other characteristics, for example, on the inductance, possible line resonances or the maintenance of certain designated preferential directions.

In this way, resistances or capacities can be applied on a carrier as comb electrode structures, where the electrodes interlock like combs (interdigital resistor and interdigital capacitor), which allows a large electrode edge surface with a low electrode distance. The comb structures can be produced, for example, with technical photo means or imprinting followed by etching of the electrode substance or by cutting with a laser. The disadvantage with electrode structures produced with this procedure is the high technical expenditure required for the production and the resulting relatively high prices for the end product and in addition large surface structures can only be produced to a limited degree.

The European patent application, EP 0755695 A1, reveals an electrode with an applied paste or binding agent containing hydrophilic microgranulates of hydrophilic polymers or water soluble substances and electrically conductive microgranulates. The application of these electrodes is done particularly on living bodies for the measurement of leakage currents such as for an ECG or an EEG and in therapy for treatment with low frequency currents or the systematic application of active substances.
The electrode is to serve to transmit current from or to living bodies and thus to achieve therapeutic effects in addition to the measurements. Due to the material applied to the electrode, water is absorbed and irreversible changes in this layer are produced so that the electrode described as an electrical component or carrier for

sensors, which is to be used for the determination of agents, is completely unsuitable.

The PCT application, WO 91/03734, describes the use and production of a resistance moisture sensor of plastic with the capability of swelling, which contains additives to increase the conductivity such as carbon, metal dust or similar things. The additives for increasing the conductivity are located in a three-dimensional polymer composition, whose position changes continually due to the swelling of the layer absorbing water, and the same applies to the geometry of the electrode, whereby disadvantageous effects occur for long-term applications. Strong swelling or quick changes in moisture conditions results in cracks in the polymer layer, which cannot be repaired.
The use as an electrical component or carrier for sensors for the detection of agents is not possible.

The purpose of the invention is to create an electrode arrangement for an electrical component and a carrier for sensors, which arrangement is applied on a substrate as a surface structure of suitable dimensions of two electrically conducting electrodes not electrically connected with one another; and which has a high flexibility for representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer, and which arrangement represents these through the conductance of a measuring probe or a function element and is simple and economical to manufacture.

This purpose is fulfilled by the characteristics listed in patent claim 1. Priority for further developments results from the subclaims.

The essence of the invention is that a number of conductive islands (passive electrodes) are applied on any given dielectric substrate, as a two-dimensional area arrangement, between two connection electrodes and these islands are not or are not essentially connected with one another and whereby relative to the complete filling of the interspace of the connection electrodes with the substance of the passive electrodes the conductance of the measuring probe or of the function element is changed. The total conductance of the measuring probe is dependent on the specific portion of the area of the passive electrodes. Because the two-dimensional distribution of the substance of the passive electrodes is only one dimension above that of a possible one-dimensional current path, the possibility of such a formation is very low. The remaining area of the substance represents a multiple non-contiguous area, in which the current paths spread in the area between the islands and around these. If when using a thin carrier, for example a foil, this is included in the flux, the islands influence the area of the carrier near to the surface structure and thus also the resulting total conductance. The advantages of such an electrode structure are found in particular in the high flexibility of the representation of the conductivities of the electrodes and/or of the substance by the conductance of a measuring probe or of a function element.

Such an island structure is, according to the invention, produced by the fine distribution of conductive substances on any insulation substrates, such as foils. The substance is firmly set on the substrate and can be sputtered on, steamed on, squirted on, dabbed on, imprinted or sprayed on, whereby a uniform distribution of the conductive islands exists.

As an option for the area island structure between the connection electrodes, these can also be arranged within special geometrical figures.

Variations of the carrier for sensors are coated on the surface with a material-selective substance, which determines the total conductance and are used as a detector for certain agents.

As an option, the substrate itself, if it is designed sufficiently thin, can also be coated so that the total conductance is essentially determined by the area close to the surface structure. The advantages of this design are found in the great variety concerning the type, form and size of the carrier and the economical manufacturing costs.

An additional advantageous form of the island structure can be created by the inclusion of hyperstructures with anisometries of substances with respect to the substrate, which the islands show in their short-range order, whereby an additional usable degree of freedom, preferably for measuring probes, such as strain gauges exists.

In addition, isotropic structures can be applied on the substrate, which structures can be combined with ring-shaped electrodes and thereby are independent concerning orientation.

In addition, a conceivable advantage is that from such electrode structures, large area function elements such as panel heating elements or photocells could be manufactured.

The advantages of the invention are found in particular in the substrate materials, which can be adjusted to the most

varied requirements, and the adjustable structure of the conductive islands. Coated carriers for sensors can be employed for the selective detection of certain agents. The manufacturing costs for the electrical components and carrier for the sensors are low according to the invention.

The invention is explained in more detail as an example of application based on figure 1 as a cross section through an electrode arrangement for an electrical component and carrier for sensors and figure 2 as a top view of an electrode arrangement for an electrical component and carrier for sensors.

According to figure 1 and figure 2, an electrode arrangement for an electrical component and carrier for a sensor consists of a dielectric substrate (1), on which two conductive electrodes (2) for connection to normal measuring means and conductive islands (3) (=passive electrodes) are arranged. The total conductivity is determined by the partial conductivity between the conductive islands (3) over the substrate (1) and the electrodes (2). The adsorption of agents on the surface of the substrate (1) and/or on the conductive islands (3) changes the total conductance of the electrode arrangement and this conductance is evaluated as normally done and can be employed, for example, for the detection of substances.

Reference symbols used:

1 Substrate

2 Electrodes

3 Conductive islands

Patent Claims

1. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element, so characterized that on a dielectric substrate (1) between two electrodes (2) a number of conductive islands (3), which are not or are not essentially connected with one another, are applied as a two-dimensional area arrangement.

2. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claim 1, so characterized that the structure of the conductive islands (3) consists of a fine distribution of conductive substances on any insulating substrate (1).

3. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface

structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 and 2, so characterized that the substance of the conductive islands (3) is firmly set on the substrate (1) and in particular it is sputtered on, steamed on, squirted on, dabbed on, imprinted or sprayed on.

4. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 to 3, so characterized that the conductive islands (3) are arranged within special geometric figures.

5. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 to 4, so characterized that the surface of the carrier for a sensor is coated with a material-selective substance.

6. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 to 5, so characterized that a carrier for the sensor with a sufficiently thin substrate (1) has a sensor-active layer on all sides.

7. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 to 6, so characterized that the conductive islands (3) in their short-range order show hyperstructures with anisometries of the substances with respect to the substrate.

8. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or

of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 to 7, so characterized that isotropic structures of conductive islands (3) with ring-shaped electrodes (2)are arranged on the substrate (1).

9. An electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1), this arrangement consisting of two electrically conductive electrodes (2), which are not electrically connected with one another, and a surface structure with suitable dimensions for the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer by the conductance of a measuring probe or of a function element according to claims 1 to 8, so characterized that the electrode arrangement is designed as a large area as a function element in particular as panel heating elements or photo cells.

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Summary

The invention describes an electrode arrangement for an electrical component and carrier for sensors, which arrangement is applied on a substrate (1) as a surface structure of suitable dimensions and this arrangement is of two electrically conducting electrodes (2) not electrically connected with one another; and this has a high flexibility concerning the representation of the conductivities of the electrode arrangement and/or of the substance of a sensor-active layer and represents these through the conductance of a measuring probe or a function element and is simple and economical to manufacture.

According to the invention, the problem is so solved that on a dielectric substrate (1) between two electrodes (2) a number of conductive islands (3), which are not or are not essentially connected with one another, are emplaced as a two-dimensional area arrangement.

(See Fig. 1)

Fig. 1

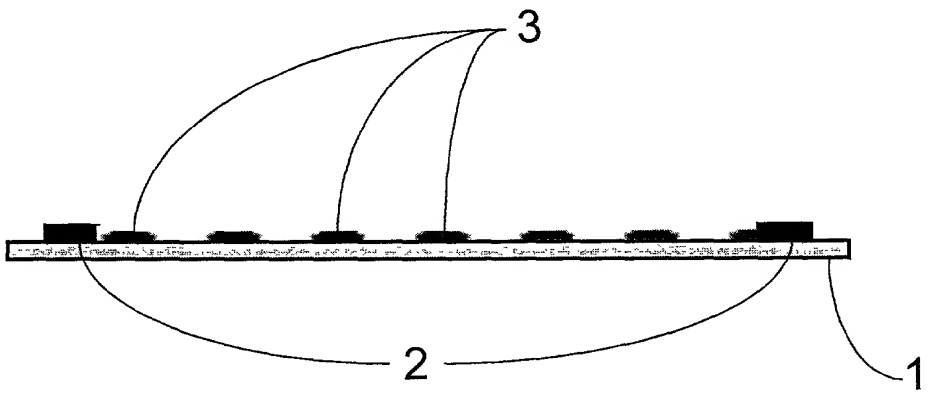
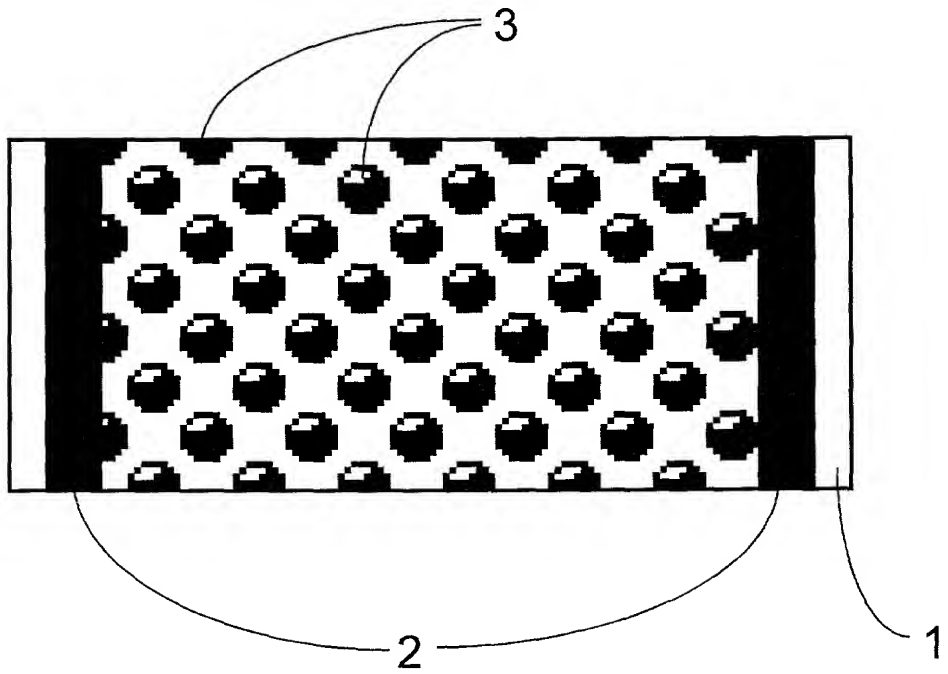


Fig. 2



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Signature:	Date:	Residence and Full Postal Address:
Full Name of Third Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Fourth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Fifth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Sixth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Seventh Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Eighth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Ninth Inventor:	Citizenship:	

DECLARATION AND POWER OF ATTORNEY FOR NATIONAL STAGE OF PCT PATENT APPLICATION

As a below-named inventor, I hereby declare that:
Bischoff, Robert

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **Electronic arrangement for an electric component and as a support for sensors** the specification of which was filed as PCT International Application number PCT/DE99/03793 on November 26., 1999

I hereby state that I believe the named inventor or inventors in this Declaration to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365 (b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s):			Priority claimed:	
298 22 007.5	Germany	December 10, 1998	X	
(Number)	(Country)	(Date filed)	Yes	No
(Number)	(Country)	(Date filed)	Yes	No

As a named inventor, I hereby appoint the following attorney to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Michael J. Striker, Reg. No. 27233

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U.S.A.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statement may jeopardize the validity of the application or any patent issued thereon.